

Memorandum

To: John S. Sanders, Ph.D., Chief
Environmental Monitoring and
Pest Management Branch

Date: January 28, 1998

From: Department of Pesticide Regulation - 1020 N Street, Room 161
Sacramento, California 95814-5624

Subject: MONITORING RESULTS FROM A BEDDED TARPED APPLICATION IN
RIVERSIDE COUNTY - METHOD 10

Introduction - Methyl bromide is widely used as a preplant soil fumigant for control of nematodes, fungi, diseases and weeds. The Department of Pesticide Regulation (DPR) and county agricultural commissioners have implemented permit conditions, including buffer zones, to mitigate unacceptable methyl bromide exposure. Buffer zone distances are set so that concentrations measured at this distance do not exceed 0.21 parts per million (ppm; 24-hour time-weighted average). The buffer zone distances for the methods have been determined from data received and evaluated by DPR to date. In some instances, methods which have not been previously monitored have been assigned similar buffer zones based on their similarity to application methods with monitoring data available. Additional monitoring was conducted to test and evaluate the effectiveness of the buffer zone distances for application methods where no or limited monitoring data was available.

Materials and Methods - The sixth application monitored was a 16.2 acre field near Indio (Riverside County) treated with methyl bromide by a tarped bed application method (method 10) on December 17, 1997. A tarped bed application is similar to a shallow tarped broadcast fumigation, where the area to be fumigated is disced and uncovered before application. In this case, tarpaulins were secured over beds formed immediately following injection of methyl bromide; the furrows were left untarped. The methyl bromide is injected into the soil through injectors at a depth of 12-14 inches. The specific equipment for this application method forms the beds and fumigates in one operation. With each pass the application equipment formed three beds with three injectors for each bed - set 5" apart. A second rig followed immediately behind to lay down



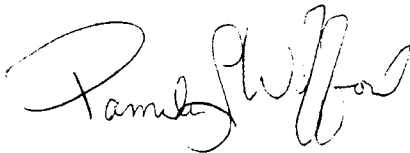
the high barrier tarpaulin. The field had sandy soil. The application rate was 200 pounds per acre of formulated product, 98 percent methyl bromide/2 percent chloropicrin. The applicators were not able to complete the entire 19-acre field application as planned, therefore the remaining 2.6 acres were treated the following day.

Ambient air samples were collected at 16 locations using charcoal tubes and SKC air samplers. Eight samplers were located at the resident buffer zone distance, from each edge. Eight other samplers were located approximately 30 feet from the field, one on each side and corner. Samplers were set up assuming that 19 acres would be fumigated and the buffer zone distance was set at 450 feet from edge of field. Instead, only 16.2 acres were treated so the samplers located at the buffer zone were beyond the actual buffer zone distance. The samplers located on the east side were located even further from the edge of field. Table 1 and Figure 1 indicate the position of each sampler. A series of three samples was collected at each of the 16 locations beginning with start of fumigation at 07:00. Samples were collected for two 6-hour and one 12-hour period, for a total of 24 hours.

The weather was clear with high clouds during daylight and clear at night with temperatures from 43 to 73 degrees Fahrenheit. Wind speeds ranged from very calm to 8 miles per hour with speeds 6 miles per hour or less for 83 percent of the time during monitoring. The wind blew predominantly to the east during the monitoring period.

Results - The buffer zone distance for the actual acreage treated was 420 feet. Ambient methyl bromide 24-hour time weighted average concentrations at the sample locations ranged from no detectable amount to 0.64 ppm. DPR's target level of 0.21 parts per million (24-hour time weighted average) was exceeded outside the buffer zone at samplers located 625 feet downwind from the application. The highest concentrations were detected during the third (12-hour) monitoring interval.

Please feel free to call if you have any questions.

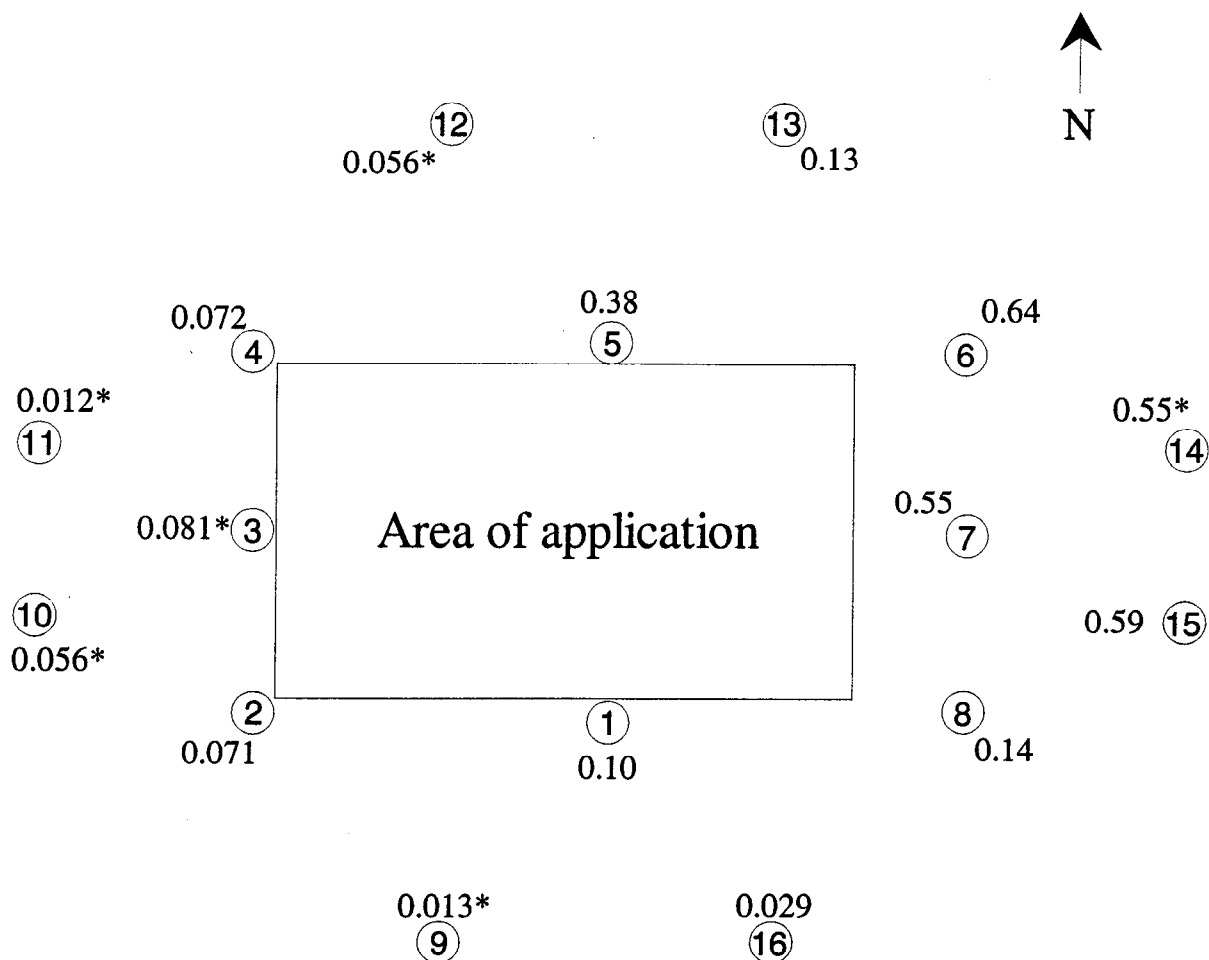


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Figure 1. The application site, sampling sites and highest 24-hour time weighted averages (parts per million). (* indicates a period of no detectable amount where $\frac{1}{2}$ the detection limit was used).



Sites 1-5 are located approx. 30 feet from field

Sites 6-8 are located approx. 200 feet from field

Sites 9-13, and 16 are located approx. 450 feet from field

Sites 14 and 15 are located approx. 625 feet from field

Table 1. Ambient methyl bromide air concentrations.

Sampler Location			Methyl Bromide (ppm) for Each Sampling Period			
			7:30 - 13:30 (6 hrs)	13:30 - 19:30 (6 hrs)	19:30 - 7:30 (12 hrs)	24-hr Peak ¹ (24 hrs)
Site	Direction	Distance (ft)				
1	south	30	0.220	0.073	0.060	0.103
2	southwest	35	0.226	0.034	0.011	0.071
3	west	30	0.149	0.171	ND ^b	0.081*
4	northwest	35	0.050	0.225	0.005	0.072
5	north	30	0.085	0.773	0.337	0.383
6	northeast	195	0.023	0.738	0.894	0.637
7	east	205	0.034	0.306	0.922	0.546
8	southeast	205	0.029	0.083	0.226	0.141
9	south	450	0.038	0.015	ND	0.013*
10	west	450	0.013	ND	ND	0.006*
11	west	450	0.011	0.030	ND	0.012*
12	north	450	ND ^a	0.203	0.007	0.056*
13	north	450	0.010	0.350	0.072	0.126
14	east	625	ND	0.730	0.738	0.553*
15	east	625	0.034	0.405	0.966	0.593
16	south	450	0.014	0.024	0.038	0.029

¹ the 24-hour time-weighted average of the concentrations

* indicates a period of no detectable amount where 1/2 the detection limit was used

ND = No detectable amount;

^a reporting limit = 0.010 ppm, ^b reporting limit = 0.005 ppm